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principal part of the difference must be attributed to an accumulation of accidental errors: since last summer I am engaged in a similar way with the parallax of 61 *Cygni.*

"The present winter is again very unfavourable for astronomical observations; since nearly six weeks we have not seen the sun. It is for this reason that I have not yet been able to publish my observations on Biela's comet, which require a new determination of the comparison star. The number of observations I have got of that object is very limited. They consist of five observations of the northern head, and three of the companion, made all in the interval between the 18th and 28th September, 1852; but I think they are all pretty exact, and will probably prove important, as it appears that this object has not been observed elsewhere, but by Prof. Secchi at Rome.* It was very interesting to see that the mutual action of the two heads still appeared to continue, notwithstanding their considerably increased relative distances. On the first day, Sept. 20, the southern head was larger than the other, and five days afterwards (Sept. 25) the northern head was brighter and considerably larger. It was obvious that the principal stream of light followed in both heads almost the direction of the line which joined the two heads.

"Mr. Lassell has sent me from Malta a circumstantial notice of his observations of *Saturn's* rings. Besides the transparency of the obscure ring, the most interesting observation appears to be the disappearance of the division in the obscure ring, which is confirmed by my own observations of the present winter. This division being easily seen last year, and with perfect surety, there is no doubt now, that the obscure ring undergoes rapid changes in very short intervals.

"It has given me great satisfaction to learn that the British Association has recommended to the Royal Society a new research on the irradiation of the Huyghenian telescope. The existing uncertainty in the amount of this quantity is, I think, the principal objection to be made against the results I have deduced. The result of the proposed research will, therefore, decide the question, which I could only exhibit in my memoir as the most probable result to be derived from the existing observations."

Extracts of a Letter from Sig. Secchi to Captain Manners, R.N. dated January 28, 1853.

"We have given instructions to Mr. Mertz to furnish us with a complete refractor, of 9 inches aperture and 14 feet focal length. The erection of the new observatory is going on well, and I hope before summer to have the principal part of the building itself quite

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* At the time of writing this letter M. Struve was not aware that the comet had been observed at the Berlin Observatory (*Ast. Nach.* No. 832, p. 246), and also at Cambridge, by Professor Challis (*Ast. Nach.* No. 836, p. 325).—R. G.

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ready. We shall have a revolving dome, 23 feet in diameter, for the equatoreal, and an elliptical room for the meridian circle, 20 feet long and 16 wide. In this a small transit instrument, 4 feet focal length, will be fixed as a collimator: and it will also have a strong cast-iron stand, to be used as a portable transit or prime vertical instrument. The Cauchoix refractor will be kept to make supplementary observations to the large equatoreal. A description of the new observatory will be published as soon as it will be in working order."

"Mr. Lassell has been kind enough to send me a very beautiful drawing of *Saturn*. Among the particulars which attracted his attention there is, as you know, the outline of the shadow, which is terminated by a prominent point at the place of the division of the rings; the appearance seemed to me a new proof that the rings are not plane; and in order to assure me of this fact experimentally, as far as was possible, I got made an artificial system like that of *Saturn*, having the surface of the ring slightly curved, as I imagine the real rings to be. The artificial rings have a curvature of about 1-20th of an inch, with a breadth of 3 inches. I exposed them to a very strong light of artificial lamps, and to the light of the sun itself, always taking care to have the incident rays inclined to the plane of the rings, according to their position in the heavens. Looking then through a telescope at this system, from an elevation like that of the earth, over the plane of the rings, I was struck with the perfect resemblance of appearances, as were several others, who witnessed the same. The curvature may be a good deal less than that used in my experiment, and still the phenomenon appears the same, as I deduced from another rough trial. I am, therefore, disposed to believe that the apparent curvature of the shadow of the ball over the ring, which turns the convexity towards the ball, is not a mere illusion of contrast of curvature but a real fact. I hope that, with the new instrument, something more satisfactory will be seen."

"The method of observing the sun with small diaphragms succeeds very well, and astronomical science will be very much indebted to Mr. Dawes for this simple contrivance. But to prevent the heating of the eye-piece, I have found that a diaphragm on single thick paper, covered with white lead, as used on visiting-cards, is perhaps the best. After some hours of observation the eye-piece is only slightly hot with our 6-inch object-glass refractor. Looking at the sun with this diaphragm on December 28, 1852, and January 1 of the present year, I observed some very interesting appearances in a very remarkable large spot. The most striking to me was that of a kind of very large ribbon, of almost oval shape, very like the edge of a lunar crater, but one part of which was projected like a bridge over a very black deep part of a nucleus. This appearance lasted only some hours, yet, during this interval of time, the outline of the crater and bridge was quite changed. I found some resemblance between these and the spots of the figures 6, 7, 10 of Sir John Herschel's observations at the Cape

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of Good Hope. Another striking appearance was, that the edge of the inner penumbra was all like a saw, as if many streamlets of fluid matter were running towards the centre of the nucleus through several obstacles, or over a very rough bottom. The changes of this spot were very great, and I made several measures and drawings, but want of space prevents me telling you more. These appearances, however, seem to me very characteristic, and may throw great light on the physical constitution of the sun."

"The faculæ are, I think, fully proved to be prominences, by the fact that they are a good deal larger near the edge than at the centre of the disc. This I have observed several times during my experiments on solar heat. Some of these faculæ remained constantly visible during half a revolution of the sun, so that their identity was assured. I mention this merely as a confirmation of Mr. Dawes' discovery. I think the faculæ are brighter, only because their tops exceed the lower part of the solar atmosphere, which may absorb a good deal of light, since it absorbs at least nine-tenths of the total heat of the sun."

Accompanying the letter from which the foregoing passages have been extracted were a series of observations of *Massalia*, extending from November 18, 1852, to January 6, 1853, which were made by Signor Secchi at Rome, with the Cauchoix equatoreal. There were also two observations of Westphal's Comet, one made on the 5th, and the other on the 30th of December. The latter observation is interesting, as being considerably later than any hitherto published. The observations both of the planet and comet will, doubtless, appear in the *Astronomische Nachrichten*. In the meantime it may be useful to insert those relating to the comet. The following are the apparent positions:—

	Rome M.T.	App. R.A.	App. Decl.
1852.	h m s	m s	′ ″
Dec. 5	7 41 58	*m* + 5 41·20	*m* + 13 36·3
5	7 55 5	*m* + 5 40·90	*m* + 13 37·8
30	7 39 32	*n* − 0 45·15	*n* − 10 55·2
30	7 45 57	*n* − 0 45·30	*n* − 10 52·8

The approximate places of the stars of comparison are—

	R.A.	Decl.
	h m s	′ ″
m	13 52 (20)	+ 66 4
n	13 11 (50)	+ 69 10

Letter from Mr. Lassell to Mr. De La Rue.

"I observe that your attention has continued to be drawn to the figure of *Saturn*, and that you have made a number of measures of his diameters; and also that Mr. Dawes has made some, though not under favourable circumstances. My drawings of *Saturn* did not profess to give the ellipticity in conformity with any measures